

Predicting the Future Sound of Music With LSTM Recurrent Neural Networks



Using Data from the Spotify API

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Overview

1. Task Definition & Data
2. Exploratory Data Analysis
3. Modeling
4. Forecasting All Features into 2025
5. Filtering Data for Artists “Ahead of Their Time”
6. Conclusion and Further Recommendations

Task:

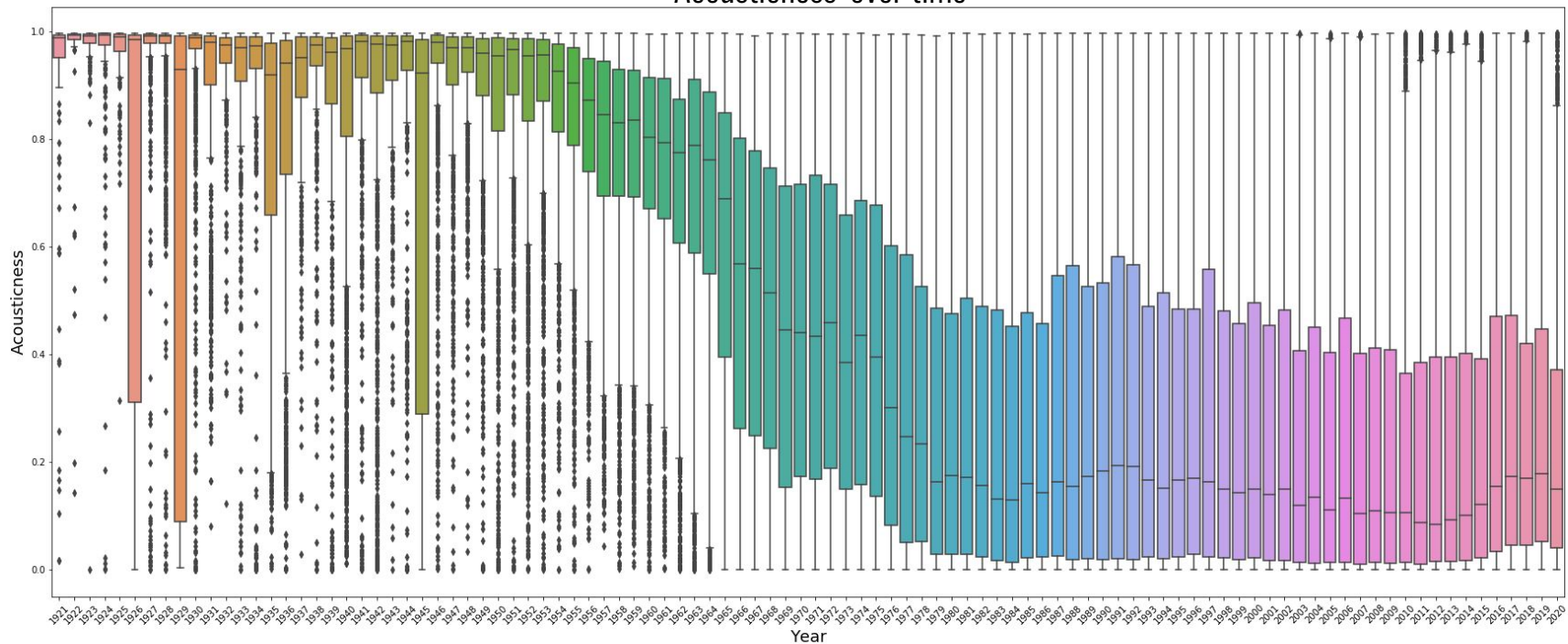
Predict how average music will sound 5 years from now

Data Utilized:

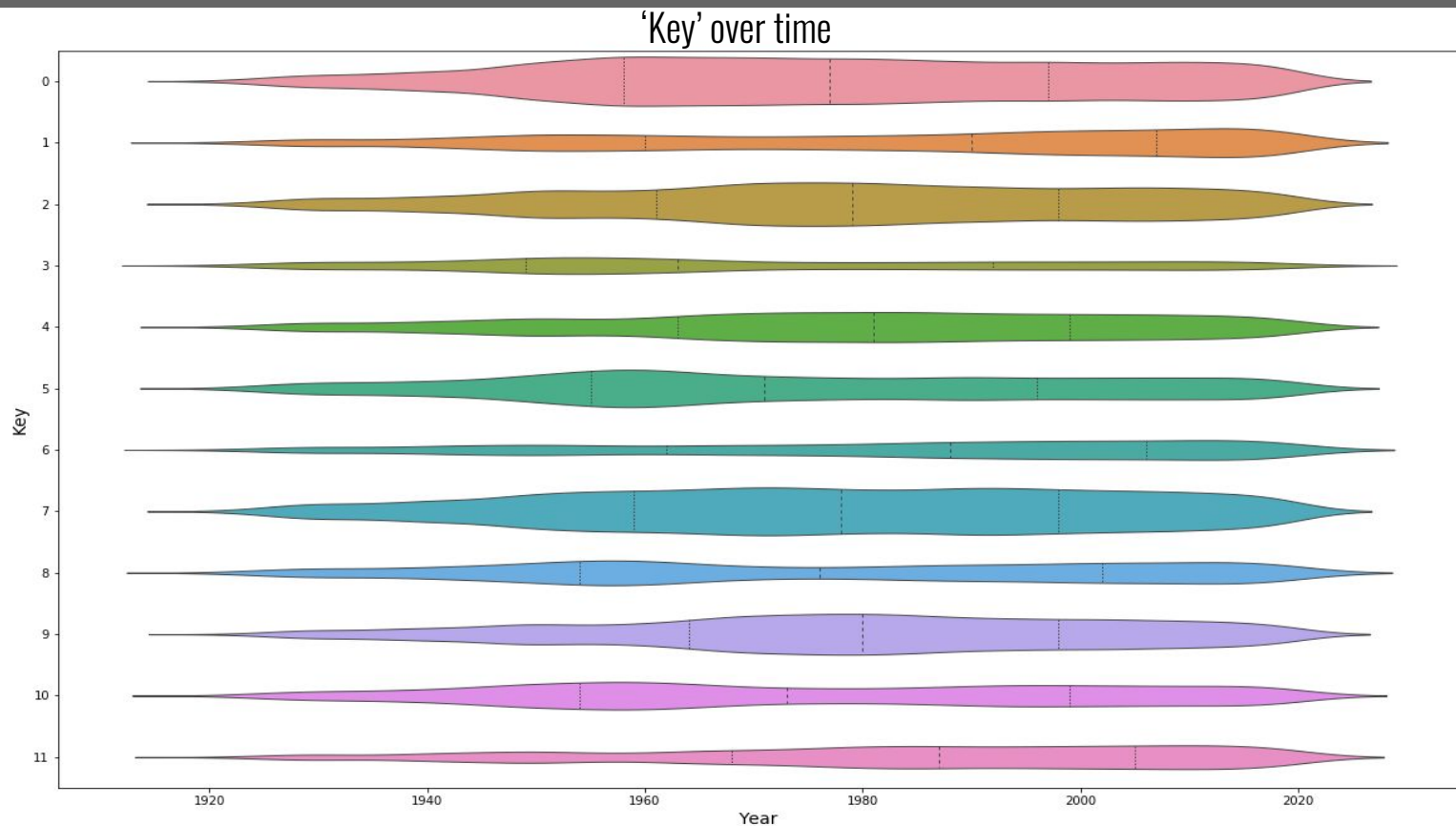
- Kaggle Dataset
 - Originally obtained from the Spotify API
 - +160,000 songs from 1920-2020
 - Numerical features of each song
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Data Exploration

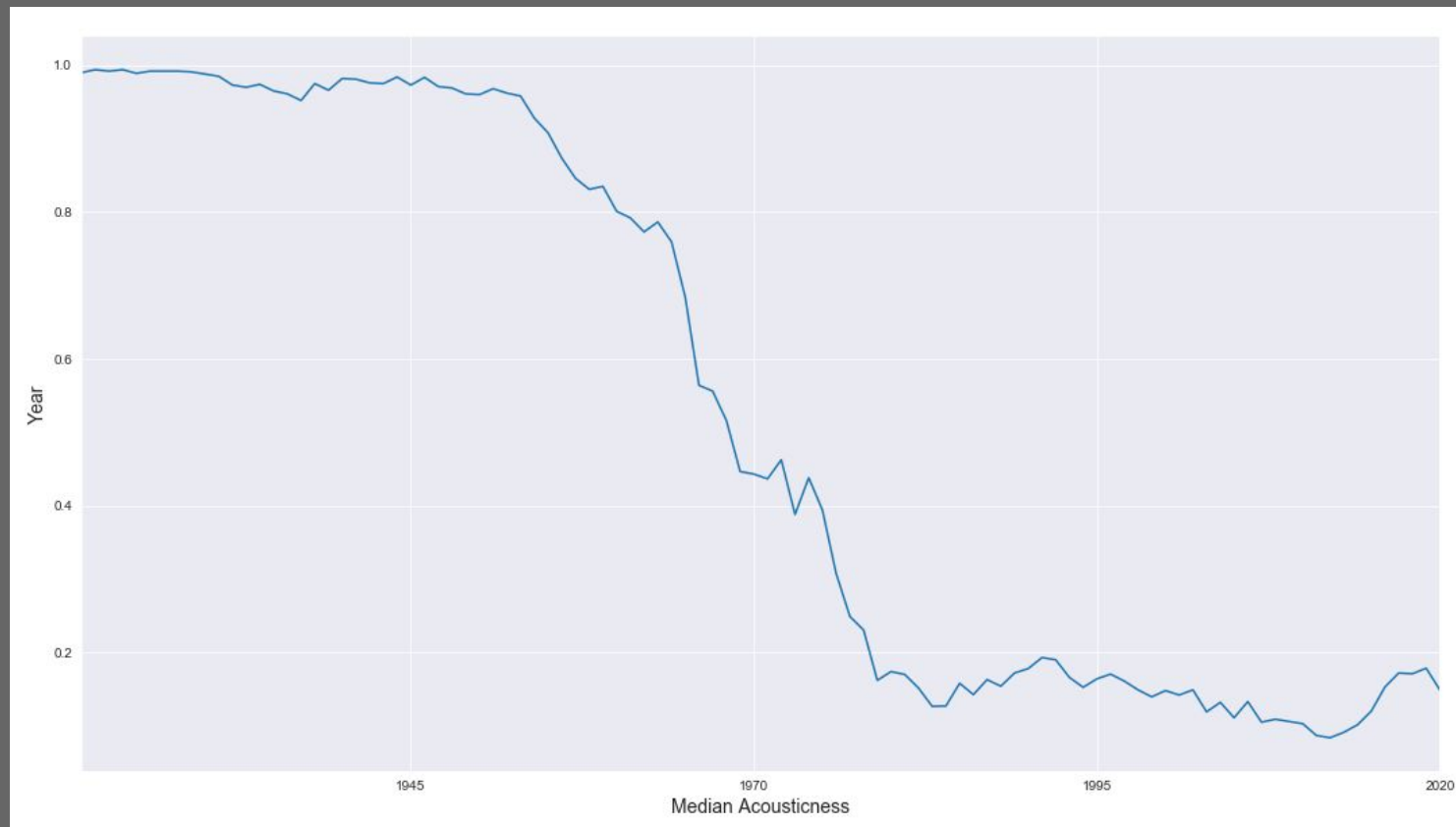
'Acousticness' over time



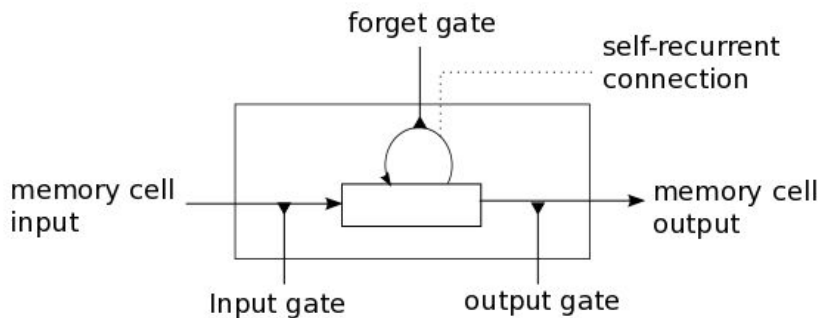
Data Exploration (continued)



Median 'Acousticness' Over Time

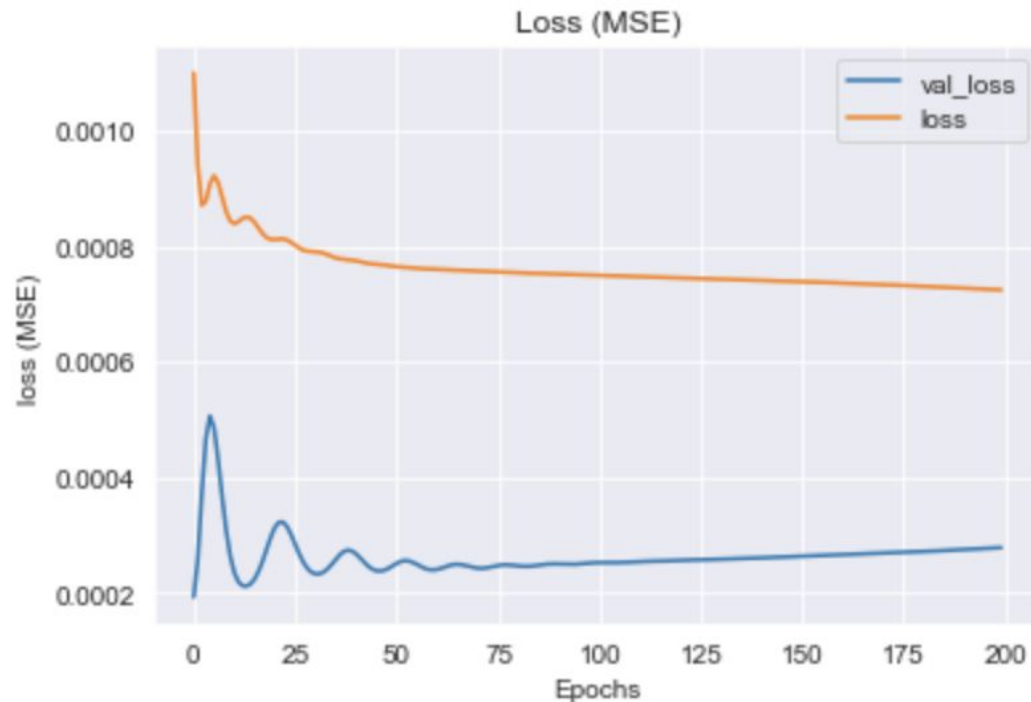


LSTM Modeling



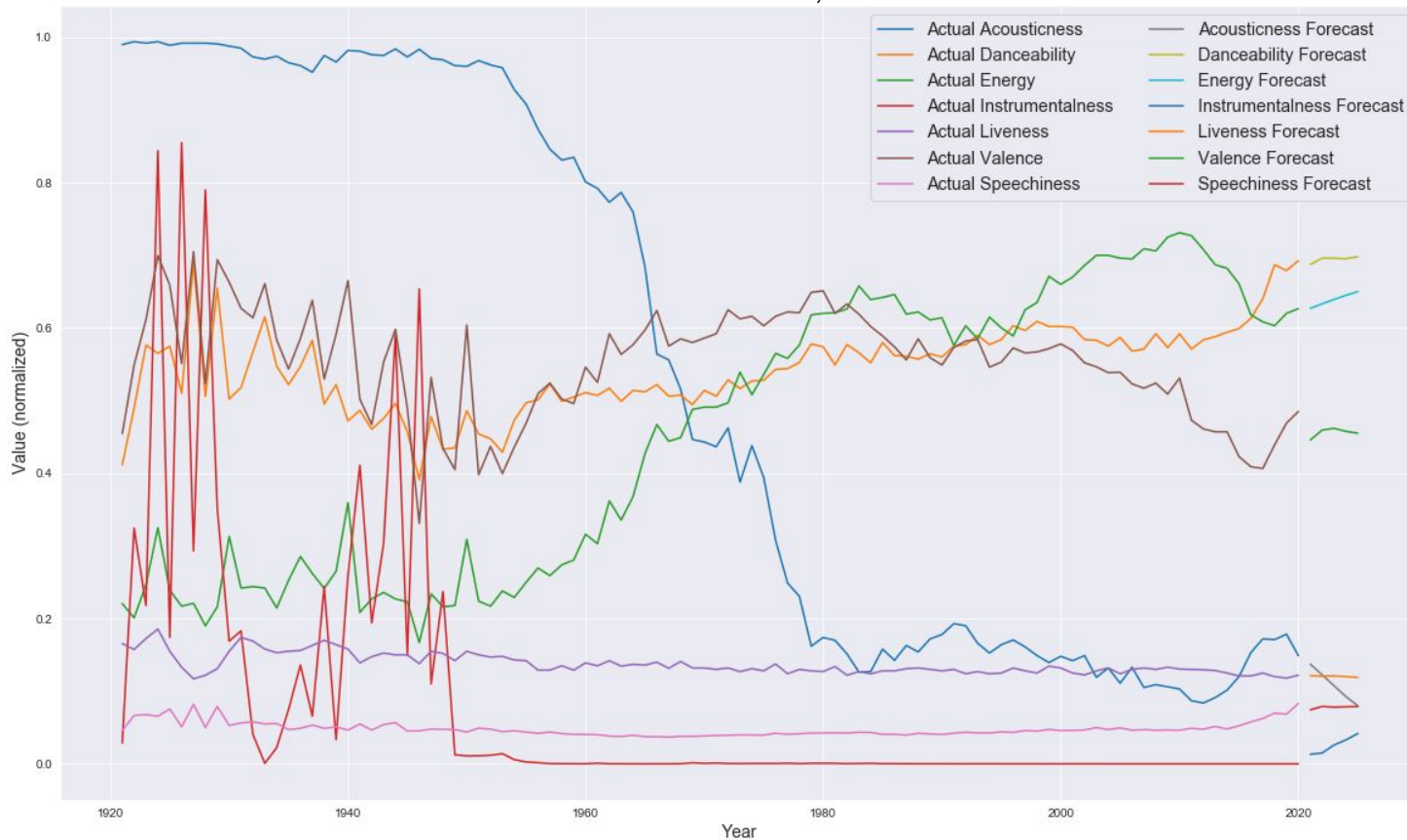
Baseline MSE: 0.00024669139559041687

Baseline RMSE: 0.015706412562721535



Forecasting Feature Values into 2025

Normalized Features Over Time, With Forecast



Artists Most 'Ahead Of Their Time'

Most "Ahead of Their Time" Artist: Twenty One Pilots - Tear In My Heart

Second Most "Ahead of Their Time" Artist: INXS - Beautiful Girl

Third and Fourth Most "Ahead of Their Time" Artists: Luh Kel, Lil Tjay - Wrong (feat. Lil Tjay) Remix

Clean Bandit, Zara Larsson - Symphony (feat. Zara Larsson)

Conclusions:

- Lower Acousticness
- Higher Energy
- Same Danceability
- Slightly Lower Valence
- Most “ahead” artists displayed 7/10 forecasted feature values
- Dataset not diverse enough to contain songs who match all future values

Further Recommendations:

- Access entire Spotify library, for better probability of complete match
 - Extend forecast model to individual genres, see how each genre has evolved over time
 - Clustering (if more songs are returned from forecast query)
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Thank You!